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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8

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April 17, 2007

Mr. Jon Nickel
ASARCO East Helena Plant
100 Smelter Road
P.O. Box 1230
East Helena, MT 59635

RE: Response to ASARCO's Questions on EPA's April 4, 2007 Comment Letter on the Design Analysis Report, ASARCO East Helena Smelter Corrective Action Management Unit (CAMU) Phase 2 Cell, January 2007, and Supplemental Information Submitted in February and March 2007

Dear Mr. Nickel:

We received your questions regarding our April 4, 2007, comment letter on ASARCO's Design Analysis Report and supporting submittals for the CAMU Phase 2 Cell. Attached please find our responses to your questions which we hope will enable you to redraft and resubmit your design package, including the Construction Quality Assurance Plan. If you wish to discuss these further or need additional clarification, please contact me directly at (303) 312-6503.

Sincerely,

Linda Jacobson
RCRA Project Manager

cc: Denise Kirkpatrick, MDEQ
Charles Figur, EPA-L



RESPONSES TO ASARCO QUESTIONS
On EPA's April 4, 2007 Comment Letter on
The Design Analysis Report and Supporting Submittals
For the CAMU Phase 2 Cell

1. Question: We believe that the conditions of 40 CFR 258 do not apply to hazardous waste landfills. Please provide EPA's rationale for applying 40 CFR 258 to the CAMU Phase 2 Cell.

Asarco states in the design report that the performance standards for the CAMU will include ARM 17.50.506. ARM 17.50.506 includes Montana's state regulations for solid waste landfills. 40 CFR 258 are the federal equivalent. Furthermore, the waste streams proposed for disposal in the CAMU include wastes that are not a hazardous waste or a remediation waste. The waste is demolition debris that is best described as a solid waste. EPA may allow as-generated non-hazardous waste into the CAMU where such waste is being used to facilitate treatment or the performance of the CAMU. EPA believes considering applicable requirements of 40 CFR 258 to ensure the CAMU is properly designed and managed is appropriate.

2. Question: The project specifications prohibit putting free liquids into the CAMU Phase 2 cell, however please indicate what is meant by non-hazardous liquids being placed in the CAMU Phase 2 Cell? Does this apply to rainwater/stormwater? Please clarify.

Both 40 CFR 264.552(a)(3) and 40 CFR 264.314 prohibit placement of liquids in a CAMU and a landfill, respectively. The purpose of EPA's comment was to clarify that we have not approved the placement of hazardous or non-hazardous liquids in the landfill. Obviously, precipitation events during the active life of the landfill will result in rainwater/storm water entering the CAMU, which we expect ASARCO to remove as soon as possible pursuant to your storm water management plan for precipitation events during construction.

3. Question: Does this mean the final construction report is required once the final cap is in place or at the end of the 2008 or 2009 construction season? Please clarify.

The final construction report is due within 60-calendar days of completion of the final cap, scheduled for 2009.

4. Question: Although the addition of a double-sided geo-composite might improve the stability of the liner system and possibly some additional liner protection, it would significantly decrease leachate collection and drainage. Composite geonets have a lower transmissivity than regular geonets and the potential for holding a significant amount of water, which will slow down the drainage rate. In our design, we are using a non-composite geonet for the leak detection drain and a single sided composite for the leachate collection drain. The largest portion of the cell covered by geonet, is the relatively flat bottom where the friction angle between the liner and the geonet is not critical to the cell performance. The geonet located on the steeper 3:1 side slopes are to be anchored with the liners and have slope lengths of less than 30 feet long. Therefore, in an application like this one where the slope lengths are short and the slopes relatively shallow, there is not a

compelling need to sacrifice transmissivity for slope stability. Please clarify whether you are requiring the use of the double-sided geo-composite, recommending it despite the engineer's explanation given above, or just suggesting that we consider it in the design.

Direct shear test and seismic stability analysis were not provided in the design report. EPA has required this information. Asarco should provide the analysis demonstrating that the friction angle between the liner and the geonet is not critical. A geo-composite drainage laminate will likely improve the stability of the liner system.

Geonet itself lacks filter fabric to avoid introduction of fines. Preventing the intrusion of fines into the geonet is critical to performance and drainage. Asarco must provide test to support assertions regarding drainage if a geo-composite is not used.

5. Question: If an equivalency analysis is performed on the GCL/CCL and the results show a CCL thickness less than 3 feet is acceptable, will a shallower depth of Compacted Clay Liner (such as 2 feet for example) be appropriate underneath the GCL.

No, a 3 foot compacted clay liner is a requirement.

6. Question: Does this imply that the bottom 12 inches of cushion material can consist of only ¼ to ½ inch size material or can this simply be material smaller than ½ inch? Please clarify what size cushion material is required.

The 12-inch cushion layer adjacent to the primary leach collection system must be material consisting of material between ¼ to ½ inch in size. This specification is based on guidance and good practice to ensure the flow of leachate and protection of the liner systems.

7. Question: Textured liners sacrifice membrane effective thickness for frictional stability. Therefore, this comment is similar to B5, in that EPA appears to be suggesting that the primary function of the liner be somewhat degraded in order to improve stability, even though the engineering and experience with the Phase I cell shows stability is not a significant issue. Please clarify whether EPA is requiring a textured liner, recommending this despite the engineer's explanation given above, or simply suggesting we consider one in the design.

Asarco must use a 60 mil double-sided textured HDPE; **this is not a suggestion but a design requirement.** EPA does not agree that a textured liner sacrifices membrane effectiveness. Asarco may provide minimum average roll values (MARVs) for the nominal thickness and nominal asperity height with test from manufactures to document Asarco's assertion. EPA will evaluate any submitted manufactures information.

As requested in other comments, Asarco must submit lab testing and seismic stability analysis of all proposed liners, geonet, and geocomposites.

8. Question: We did not intend to suggest that we place materials with extreme pH in the CAMU Phase 2 Cell. Asarco has taken steps to drain the storage tanks in the acid

plant, which may have been a primary source of extreme PH material, and the Contractor will be required to neutralize any small remaining residual acids that might be left in pipe elbows or low spots. In addition, we have included HDPE liners in our design because it is the best product for materials with varying pH. Does EPA agree with this approach?

EPA agrees that the materials of construction must be compatible with the anticipated waste streams. Please specify the volume of extreme pH material from elbows and low spots which ASARCO estimates will require neutralization. Free liquids are prohibited from disposal in the CAMU.

9. Question: If GCL is used, will this testing criteria still be required?

Testing criteria will be required even if a GCL is used to ensure that the compact clay liner meets a hydraulic conductivity of no more than $1.0 * 10^{-6}$, with a hydraulic conductivity of no more than $1*10^{-7}$ being the goal. The frequency of sampling and criteria should be proposed by Asarco if a GCL is proposed. EPA will review the proposal.

10. Question: Is this requirement referencing the Compacted Clay Liner material only?

Yes. The compact clay liner may not include particles greater than 1 inch.

11. Question: Will these criteria be required if GCL is used?

Testing will be required to ensure the clay liner meets the required specifications. The frequency of sampling and criteria should be proposed by Asarco if a GCL is proposed. EPA will review the proposal.

12. Question: Will these field form submittals still be required by the suggested transmission once the liners have been constructed?

The requested field forms are for construction QA/QC tests. It will be necessary to submit such forms for construction of the liners, geotextiles, as well as construction of both the temporary and permanent caps.

13. Question: We are unclear as to EPA's expectations regarding the analytical data for each CAMU waste stream. We have reviewed the waste material categories, the manufacture's specification for these material types, evaluated the liner performance against these waste types, and have included HDPE liners in our design because it is the best product for these materials. Does EPA agree with this approach?

Table 3-3 of the design report includes an estimated volume (cubic yards). EPA is asking for an estimation of the weight of each general waste category and any analytical data for each waste stream, such as TCLP data.

14. Question: If a geocomposite is used, we would like to eliminate the 12 inch drainage layer and replace it with 12 inches of cover soil. Does EPA have any concerns with this plan for incorporating their comment?

EPA's recommends using a geocomposite especially on the cap slopes to prevent sloughing. Asarco must include stability information demonstrating that this is not necessary. We believe the drainage layer should be a 12-inch layer of gravel or other suitable material. EPA does not approve the use of 12 inches of soil at this time; EPA will evaluate the cap design upon receiving further information in the design report; but, the drainage material's particle size must not impede the movement of liquid.

15. Question: The current design requires the surface of the waste to be level and smooth, prior to placement of the 6-inch gas migration layer, a geosynthetic clay liner (GCL), a 40 mil HDPE liner a drainage layer (to be replaced by a composite geonet) and finally cover soil. Because the GCL is itself a sandwich of clay and geotextile that will provide excellent protection for the overlying HDPE liner, it is unclear why EPA recommends an additional 6-inches of gas migration material in addition to the GCL in order to provide sufficient protection of the HDPE liner. Please clarify.

Please note that at this time, EPA does not approve replacing the drainage layer with a composite geonet. We recommended that the top of the waste be covered with 12 inches rather than 6 inches to ensure that any settling of waste would not result in a puncture of the GCL and HDPE liner. Solid waste landfills in Montana normally have 12 inches on top of the waste between daily cover and the gas migration layer. Daily cover has not been included in the design of the CAMU. Therefore, ensuring the cap's integrity by an additional 6 inches seems prudent.

16. Question: Given that the cell cap has 5:1 slopes, the design engineer does not feel interface friction testing is necessary. Do EPA's engineers disagree? If so, is there any degree of slope at which EPA's engineer's would feel confident that this testing is no longer required?

Asarco must include the requested interface friction testing on the proposed design.

17. Question: We cannot find any guidance on inspection frequency. Please provide rationale for increasing the frequency of inspections.

The CAMU regulations do not specify post-closure inspection frequency. Inspection frequency for hazardous waste units with waste left in place is governed by an approved post-closure plan. The regulations do not specify an inspection frequency for post-closure care. Regulated units in Montana with waste left in place such as landfarms, surface impoundments, and landfills, are required to be inspected quarterly to semi-annually. Inspections must be performed semi-annually by a technically trained person. Some sites are also required to be inspected annually by a P.E.

Solid waste landfills in Montana must be inspected at least annually by a licensed P.E. The resulting P.E. annual report must support financial assurance cost estimates and adjustments, if

necessary. Monitoring reports must provide adequate data to assess performance of control systems and need for corrective actions. Financial assurance must be annually reviewed and increased for at least inflation, but also any annual increases in maintenance.

Asarco will be required to inspect the CAMU semi-annually including one inspection per year by a P.E. This frequency may be decrease after vegetation has been adequately established and routine monitoring demonstrates the performance of the cap and liners.